**PRESENTATION SHEET**
**for PCI Project:**

**PCI 6.20.6 "Sărmășel underground gas storage in Romania" - „Increase of underground storage capacity for natural gas at Sărmășel UGS from 900 mil. cm/cycle to 1550 mil. cm/cycle"**

**SNGN ROMGAZ SA – Natural Gas Underground Storage Subsidiary DEPOGAZ Ploiești SRL**

1. ENTSOG code: UGS-N-371;
2. PCI name: "Sărmășel underground gas storage in Romania"
3. Category: Gas Infrastructure
4. Project promoter: SNGN ROMGAZ SA - Natural Gas Underground Storage Subsidiary DEPOGAZ Ploiești SRL
5. Countries involved: România, RO
6. Technical description of the project:

The project aims to develop the existing Sărmășel underground storage facility through an increase in storage capacity from 900 million scm/cycle to 1550 million scm/cycle (a 650 million scm/cycle capacity increase). Through an increase of compressor capacity, drilling of new wells and new surface infrastructure, the injection rate will increase by 4 million scm/day up to a total of 10 million scm/day, and the withdrawal rate will increase by 4 million scm/day up to a total of 12 million scm/day.
From a technical point of view the project includes drilling new wells, a new modern surface infrastructure according to European standards regarding safety and control, expanding and optimizing the compressor units, modernization of separation units and complete upgrading of the fiscal metering system. The injection / withdrawal system is designed so that it ensures gas flows for injection and withdrawal on separate dedicated collecting pipelines for each geological horizon.
The new infrastructure will expand the existing storage facility of Sărmășel UGS, in phases, as follows:
Phase I:

- Modernization of 12 existing wells;
- Drilling of 6 new wells;
- Surface technological installations for 6 wells

Phase II:

- Modernization of 15 existing wells;
- 8 new gas central processing units;
- 7.7 Km of gas flow lines;
- 9.6 km gathering pipes;

- Modernization of gas separation and fiscal metering unit (ISM);
- Installation of facilities for the production from renewable sources of electricity and heating agent, for administrative and technological needs;
- Digitalization of natural gas storage and withdrawal processes

Phase III:

- Drilling of 32 wells;
- 41 km of gas flow lines;
- 9.6 km of gathering pipes;
- 3 gas compressor stations equipped with hydrogen ready gas-compressors, using up to 20% mix of hydrogen;
- 2 gas dehydration plants using TEG;
- Expansion of gas separation and fiscal metering unit (ISM);
- Interconnection to NTS;
- Expansion of facilities for the production from renewable sources of electricity and heating agent, for administrative and technological needs;
- Expansion of digitalization of natural gas storage and withdrawal processes

The implementation of the technical chosen solution according to the feasibility study will accomplish a new designed infrastructure that will allow:

- The increase of gas storage capacity by 650 million scm/cycle and int increase of daily injection/withdrawal rate by 4 million scm/day
- The separation of the gas flows in/from the geological horizons of the storage, which will make possible the simultaneous use of the Sărmășel UGS both for injection and withdrawal;
- monitoring the quantities of gas transported for each of the geological structures of the UGS;
- 25% decrease of energy consumption during the gas storage processes through the execution and use of a system for producing energy from renewable sources (photovoltaic panels) and the use of LED technology for interior and exterior lighting.

**7.** Project location:

The Sărmăşel storage facility lies the north of Transylvanian basin, in the vicinity of Sărmășel town, 35 km away from Tg. Mureş, 35 km N of Luduş and 48 km E from Cluj Napoca. From the administrative point of view the area belongs to Mureş County.

**8.** Project objectives:

The implementation of the project will contribute to achieving the following objectives:

- Increase of security of supply through the development and diversification of natural gas resources in the SE of Europe, ensuring a better energetic independence and mitigating the risks of gas flow interruption during peak periods with reference to different disruptive scenarios;
- The project will contribute to gas market integration as it will accomplish a 32% increase of the daily withdrawal capacity, up to a total of 12 million scm/day, with immediate effects on diminishing market congestion, especially for the storage capacities located in the South of Romania, as the implementation of the project offers the better management of resources especially in different disruptive supply scenarios;

- Expanding the portfolio of storage services with complex services that integrate, among others, flexibility in operation and network balancing services. The new surface infrastructure with provide a high degree of flexibility that allows the simultaneous use of UGS for both injection and withdrawal as it separates the gas flows that circulate in the three geological objectives that comprise the storage facility;
- The reduction of carbon emissions will be achieved through the decrease of the energy costs required for the storage process by 25%, as well as through the implementation (as part of the project) of a renewable energy producing solar panel system and the use of LED lighting for both indoor and outdoor use;
- The project contributes to a reduction of greenhouse gas and pollutant emissions, aligned to the context of European decarbonization policies and the overall increase in costs of ETS emission certificates. The implementation of the project will allow the role of natural gases or of gases from renewable sources to increase significantly;
- The project contributes to N-1 rule on a regional level, according to EU Regulation 1938/2017. The implementation of the project allows the N-1 indicator to increase from 106,3% up to 111,81%;
- The project lowers the dependence on gas imports during the cold season.

**9.** Project contribution to the European and regional energetic security:

The project “Increase of underground storage capacity for natural gas at Sărmășel UGS from 900 mil. scm/cycle to 1550 mil. scm/cycle” will accomplish a major increase in the storage capacity for SE of Europe, and will also boost and accelerate the development of the newly discovered resources located offshore, in the Black Sea, and onshore, in Romania:

- contribution to the development of production capacities in the area, ensuring the conditions for their superior exploitation in the transition to green energy, by renouncing the use of biomass and coal;
- contribution to compliance with the obligations to grant solidarity aid imposed by EU Regulation 1938/2017;
- the connection of Sărmășel UGS via North - South Corridor to the "Bulgaria - Romania - Hungary - Austria Corridor", a project implemented on the territory of our country by SNTGN TRANSGAZ;
- the connection of the Sărmășel UGS to Central East-West Corridor, a project implemented in Romania by SNTGN TRANSGAZ and which aims the increase in the transmission capacity at the cross-border interconnection point with Hungary, Csanadpalota-Horia, and to ensure the physical bi-directional transmission of gas between this point and other cross-border interconnection points.

**10.** Sales market: internal and regional market
**11.** Purchasing strategy: PUBLIC TENDERING
**12.** Final date of feasibility study: 15.05.2021;
**13.** Market study: 01.03.2019 – 31.12.2019 (included in the feasibility study);
**14.** Start date of project (FID) Phase I :2021;
**15.** Update of reservoir study: 2024
**16.** Estimated start date of project (FID) Phase II: 2025
**17.** Estimated start date of project (FID) Phase III: 2025

**18.** Estimated final date of project: 10/2030. Phase III of project is dependent on obtaining the agreements from ROMGAZ and from the National Agency for Mineral Resources (ANRM) in order to transform the geological horizon V into an underground storage.

**19.** Estimated value of project (CAPEX) including cushion gas: 185 million EUR.

**20.** Financing sources: own sources and attracted sources (including EU funds)

**21.** Production and operation after implementation of project:

- Additional storage capacity obtained - 650 mil. scm/cycle will be included in the list of available capacities for gas storage. The storage facility will be operated by SNGN ROMGAZ SA – Natural Gas Underground Storage Subsidiary DEPOGAZ Ploiesti SRL.
- The completion of the project will contribute to the increase of the national storage capacity operated by DEPOGAZ by about 23%

**22.** Status of project:

- Phase I of the project is undergoing, i.e. the execution works for the modernization of 12 wells have been completed and the technical project (PT) for the drilling of 6 new wells has been completed;
- Phase II of the project is in the stage of identifying available funding sources / prior to the investment decision (FID);
- Phase III of the project depends upon obtaining the agreements from Romgaz and ANRM for the transformation of geological horizon V into a storage facility and upon the identification of funding sources.

**23.** Environmental protection: The project conforms to on environmental legislation in force.

**24.** The calendar for project implementation is:

| Implementation phases | Estimated start date | Estimated end date |
|---|---|---|
| Pre-Feasibility study | | 2016 |
| Feasibility study | 2019 | 2021 |
| FID Phase I | | 2021 |
| Engineering Phase I | 2022 | 2023 |
| Technical documentation for construction permit and permitting - Phase I | 2023 | 2024 |
| Tendering procedure and awarding works contract Phase I | 2022 | 2023 |
| Construction Phase I | 2023 | 2024 |
| Commissioning / start of operation Phase I | 2023 | 2024 |
| Reservoir study for Phases II and III | 03.2024 | 12.2024 |
| FID Phase II | | 2025 |
| Engineering Phase II | 2025 | 2026 |
| Technical documentation for construction permit and permitting - Phase II | 2025 | 2026 |
| Tendering procedure and awarding works contract Phase II | 2027 | 2027 |
| Construction Phase II | 2028 | 2030 |
| Commissioning / start of operation Phase II | | 2030 |
| FID Phase III | | 2025 |
| Engineering Phase III | 2025 | 2026 |

| Implementation phases | Estimated start date | Estimated end date |
|---|---|---|
| Technical documentation for construction permit and permitting - Phase III | 2025 | 2026 |
| Tendering procedure and awarding works contract Phase III | 2026 | 2027 |
| Construction Phase III | 2028 | 2030 |
| Commissioning / start of operation Phase III | | 2030 |

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20.12.2023